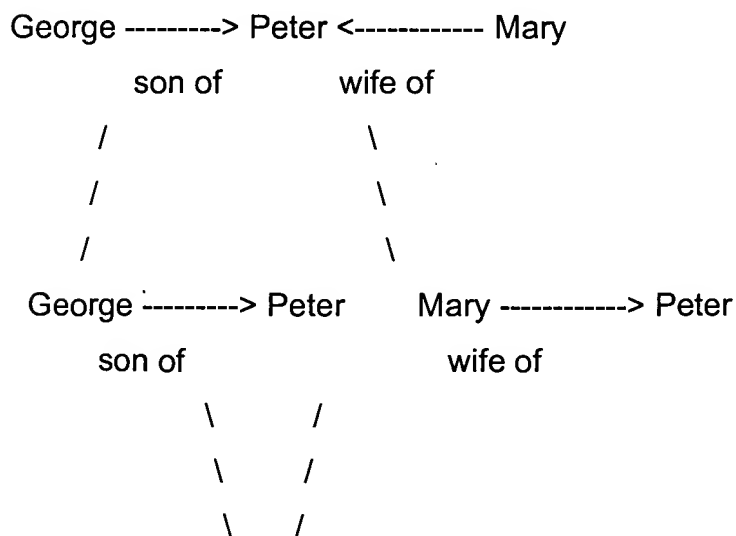## Remarks and Arguments

Claims 1-36 have been presented for examination. Claims 1, 5, 7, 17, 21, 23, 33 and 35 have been amended.

Claims 1-36 have been rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,768,578 (Kirk.)

In accordance with the present invention, both information sources and queries are processed to generate knowledge representations that consist of graph structures. The knowledge representation graph structures are then converted into graph structures. The relevance of each source is determined by comparing the graph structure corresponding to the source to the graph structure corresponding to the query. Relevant sources are those whose graph structure is either wholly or partially contained within the graph structure corresponding to the query.

The information sources are then classified by constructing a "graph containment hierarchy" of the relevant information sources. This hierarchy consists of a hierarchy of the information source graph structures (supergraphs and subgraphs) based on how much of each supergraph/subgraph structure is contained within the query graph structure. Views of this hierarchy can be displayed to a searcher with a supergraph/subgraph view being displayed adjacent to the information source from which it was derived. An example of a graph containment hierarchy is as follows:
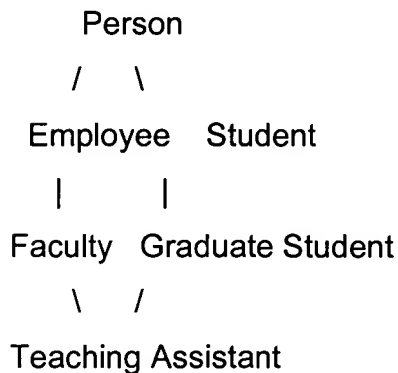
```
George --------> Peter <------------ Mary
        son of          wife of
     /                   \
     /                    \
     /                     \
George --------> Peter     Mary ------------> Peter
     son of                     wife of
        \     /
         \     /
          \     /
```

4

Peter

In this containment hierarchy, the graph consisting of a single node (Peter) is contained in two graphs each having two nodes and one edge. These two graphs are, in turn, contained in a graph having three nodes and two edges. The hierarchy is composed of supergraphs, graphs and subgraphs as discussed in the present specification at page 13, line 3 to page 14, line 7. The present invention uses these directed graphs to visually represent the knowledge sources.

The Kirk patent is concerned with a user interface for information retrieval based on knowledge representations. In the Kirk patent, there are several uses of the term "hierarchy". However, every such use of this term is concerned with hierarchies of concepts, classes or types. At no point in the patent is there ever a concern with a graph containment hierarchy, which is the hierarchy on which the present invention is based. The following example illustrates a concept hierarchy.

```
     Person
    /    \
 Employee   Student
   |        |
Faculty   Graduate Student
    \    /
Teaching Assistant
```

In this concept hierarchy, an employee is a specialization of a person, a faculty is a specialization of an employee, and so on. Note that a teaching assistant is a specialization of both the faculty and graduate student concepts. In the Kirk reference it is made clear that the disclosed hierarchies are the same concept hierarchies used in common knowledge representation languages such as "CLASSIC." See, for example, Kirk, column 7, lines 3-29. Thus, the directed graphs in Kirk are visual representations

5

of concept hierarchies not visual representations of knowledge sources as is the case in the present invention.

The independent claims 1, 17, 33 and 35 have been amended to point out this distinction. For example, claim 1, which is representative, now recites in lines 7-12, "matching the query knowledge representation graph structure ... to generate a graph containment hierarchy of supergraph structures and subgraph structures in which each of the supergraph structures and subgraph structures corresponds to at least one information source." As discussed above, the Kirk patent does not disclose graph containment hierarchies. Accordingly, it does not disclose subgraphs or supergraphs, nor a graph containment hierarchy of supergraph structures and subgraph structures in which each of the supergraph structures and subgraph structures corresponds to at least one information source as recited in claim 1. Note, the use of the term "subgraph" in the present application clearly refers to containment of graphs, not to the notion of specialization of concepts as disclosed in the Kirk patent. Consequently, amended claim 1 patentably distinguishes over the cited Kirk reference. Similar amendments have been made to claims 17, 33 and 35 and these claim distinguish over the cited reference in the same manner as amended claim 1.

Claims 2-11 are dependent on claim 1, either directly or indirectly, and distinguish over the cited reference in the same manner as claim 1. In addition, these claims also recite additional elements not disclosed in Kirk. For example, regarding claims 4-6, Kirk visually displays the concept hierarchy as a directed graph that may be used by the user to construct queries (by clicking on icons corresponding to nodes). However, claim 4 recites that the graph structure of a query is displayed to the user, claim 5 recites that the supergraph and subgraph structures are displayed and claim 6 recites that the supergraph/subgraph structures are displayed adjacent to information identifying the information source. Queries and information sources are never represented by directed graphs in the Kirk patent. Amendments have been made to claims 5 and 7 in order to accommodate the changes made to claim 1.

Claim 12 recites a method for navigating through a single information source by creating and displaying a graph structure for the source (step a) along with the

6

A

information source content (step b). The information source can be navigated by highlighting portions of the content as the corresponding vertices and edges are selected (step c). The <u>Kirk</u> patent does not represent information sources as directed graphs, it only represents the concept hierarchy as a directed graph. Accordingly it has no mechanism for highlighting an item in an information source that corresponds to vertices and edges of the graph as recited in claim 12, step c. The item 708 to which the examiner refers is a hyperlink, not content that corresponds to vertices and edges of a graph as recited in claim 12. Therefore, claim 12 patentably distinguishes over the cited reference.

Claims 13-16 depend, either directly or indirectly, on claim 12 and distinguish in the same manner over the cited reference. In addition, these claims recite additional steps not disclosed in <u>Kirk</u>. In particular, claim 13 recites highlighting a feature in the graph and the corresponding content in the information source. The item 708 to which the examiner refers is highlighted in the information source content, not the graph structure. Claim 14 recites highlighting related features in the graph and the corresponding related items content in the information source. The highlighting of related structures is not discussed in <u>Kirk</u>. Claim 15 recites highlighting content in the information source and then highlighting the corresponding feature in the graph structure. The highlighting of the graph structure is not discussed in <u>Kirk</u>. Finally, claim 14 recites highlighting related items content in the information source and then highlighting related features in the graph structure. The highlighting of related structures is not discussed in <u>Kirk</u>. Consequently, claims 13-16 patentably distinguish over the cited reference.

Claims 17-27 contain limitations that parallel the limitations in claims 1-11 and distinguish over the cited reference in the same manner as claims 1-11 as discussed above. Amendments have been made to claims 21 and 23 in order to accommodate the changes made to claim 17.
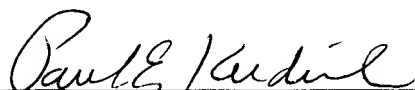
Claims 28-32 contain limitations that parallel the limitations in claims 12-16 and distinguish over the cited reference in the same manner as claims 12-16 as discussed above.

A

Claims 33 and 35 have been amended in a manner similar to claim 1 as discussed above and distinguish over the cited reference in the same manner as amended claim 1. Claim 34 is dependent on claim 33 and incorporates the limitations thereof. Consequently, it distinguishes over the cited reference in the same manner as claim 33.

Claim 36 contains limitations that parallel those in claim 12. Consequently, it distinguishes over the cited reference in the same manner as claim 12 as discussed above.

In light of the forgoing amendments and remarks, this application is now believed in condition for allowance and a notice of allowance is earnestly solicited. If the examiner has any further questions regarding this amendment, he is invited to call applicants' attorney at the number listed below. The examiner is hereby authorized to charge any fees or direct any payment under 37 C.F.R. §§1.17, 1.16 to Deposit Account number 02-3038.

Respectfully submitted

_____   Date: _11/14/02_____
Paul E. Kudirka, Esq. Reg. No. 26,931
KUDIRKA & JOBSE, LLP
Customer Number 021127
Tel: (617) 367-4600 Fax: (617) 367-4656

A